ES.3 DEIS ALTERNATIVES AND PREVIOUSLY-STUDIED ALTERNATIVES

ES.3.1 PREVIOUSLY-STUDIED ALTERNATIVES

The current MIS/EIS process has taken into account the history of the study area with respect to prior studies and previously-considered alternatives. The alternatives that were given consideration in the previous environmental documents, but ultimately eliminated from further study, were revisited briefly as part of this study. Although it was determined that these alternatives did not meet the earlier project purposes, they were reexamined to see if they may have merit with respect to today's conditions.

Alternatives considered in the previous environmental documents included the "no build" and "mass transit" alternatives, a "widening" alternative and five "new expressway" alternatives on new location. The new expressway alternatives included both full build alternatives, which would complete Route 11 to I-95/I-395, and partial build alternatives.

Preparation of an Administrative Final Environmental Impact Statement (FEIS) in 1990 resulted in a preferred alternative for continuation of the Route 11 expressway; this alternative was known as Alternative C/D. Alternative C/D was a refinement and

combination of Alternatives C and D that was developed based on public comment and agency input received on the DEIS.

Both former Alternatives C and D were considered infeasible due to their impacts to public water supply resources, fisheries, wetlands and historic resources, in addition to extensive relocation and channelization of Latimer Brook. Further, Alternative C would have had an unacceptable LOS in one area. Nevertheless, certain aspects of both of these alternatives had merit as potentially being the least environmentally damaging alignments that would substantially satisfy future traffic needs.

Alternative C/D was a refinement and combination of Alternatives C and D that was developed based on public comment and agency input received on the DEIS... Alternative C/D, was developed to incorporate the most effective and least environmentally damaging elements of both the C and D alternatives... As a result of continuing Route 82/85/11 studies, the C/D Alternative was advanced to a preliminary design (PD)

Alternative C/D, was developed to incorporate the most effective and least environmentally damaging elements of both the C and D alternatives. Alternative C/D generally had less impact on resources in the corridor than any of the other alternatives developed to date, while at the same time provided the most favorable balance between improved traffic and safety conditions and minimized impacts to the environment. The FEIS that cited this alternative as preferred, however, was never finalized; a Record of Decision (ROD) was not issued for the document; and state/federal permit applications for the C/D alternative were not prepared.

As a result of continuing Route 82/85/11 studies, the C/D Alternative was advanced to a preliminary design (PD) phase in the early 1990s. This was done in order to obtain a more precise idea as to whether this alternative expressway alignment was indeed feasible. During the PD process, more detailed roadway alignment and engineering information was developed. A wetland field delineation was also performed as part of the PD phase in order to more accurately define the sensitive resource areas and reduce potential impacts.

The PD alignment for continuation of Route 11 (that is, a refined version of the C/D alignment) utilized aerial and field mapping showing topographic features and delineated wetlands. Although the PD plans were only preliminary, quantification and evaluation of impacts was quite reliable based on these more detailed plans and sufficient to determine that the adverse impacts associated with construction of the roadway were minimized to the extent that they could be at this early design stage. As the most favorable of the overland routes evaluated prior to initiating the current studies, the PD alignment was the only alternative from the prior studies to be advanced for consideration in this DEIS. In this document, this alternative is referred to as the 1992 Preliminary Design, or 92PD, alignment.

ES.3.2 DEVELOPMENT AND SCREENING OF DEIS ALTERNATIVES

In the fall of 1997, renewed interest and on-going traffic concerns in the corridor prompted ConnDOT and FHWA to, again, explore corridor options and undertake the current study. An MIS/EIS Corridor Advisory Committee (AC), established to aid in the decision-making process, was made up of representatives from federal agencies including FHWA, ACOE, Environmental Protection Agency (EPA), Fish and Wildlife Service (FWS) and the Federal Transit Authority (FTA); state agencies including the Department of Environmental Protection (DEP), OPM, and State Historic Preservation Officer (SHPO); local town governments; and the Southeast Connecticut Council of Governments (SCCOG). The AC provides a forum for discussion of project concepts and issues, the exchange of information, and the solicitation of public and agency input.

A variety of alternatives has been discussed with the AC in order to develop the alternatives for the MIS and EIS. Discussions of the 92PD alignment and the concept of widening existing Routes 82 and 85 were taken to the Route 82/85/11 AC for their input and suggestions. Throughout the process, the AC has stressed the importance of minimizing impacts to both environmental and socioeconomic resources within the corridor, while promoting traffic improvement goals outlined in the project purpose and need statement.

Through the recommendations of AC members as well as the comments received from other agency representatives, the general public and other interested parties during the information gathering process, additional alternatives were developed and have been included in this study. These additional alignments were developed in an effort to further avoid impacts to both the natural and built environment of the corridor. Although there has been substantial local interest in moving forward with construction of the continuation of Route 11, the requirements under state and federal law for evaluating a full range of alternatives have been stressed. In the interest of broadening the range of alternatives, with particular attention to those with the potential to minimize resource impacts, the federal and state agencies independently developed additional alternative concepts that they wanted to see considered in the study. To this end, several new alternatives were introduced.

ES.3.3 DESCRIPTION OF DEIS ALTERNATIVES

The following describes each of the alternatives selected for consideration in this DEIS. These alternatives include the no build scenario, mass transit options, Transportation Systems Management (TSM) options, Transportation Demand Management (TDM) options and several new construction, or "build", alternatives that involve either widening and upgrading existing routes or continuing Route 11 as a limited access expressway (Figure ES-3). For each of the build alternatives (widening or new location), detailed

Widening Alternatives

W (2) : Upgrade to full shoulders and turning lanes

W (4): Widen to 4 lanes plus turning lanes; full shoulders

W(4)m: Widen to 4 lanes plus turning lanes; modified shoulders

Expressway Alternatives

92PD: 1992 design; 4 lane expressway

E, F, G: 2 lane expressway alternative and 4 lane expressway alternative

H: Partial build; 2 lane expressway alternative and 4 lane expressway alternative

LEGEND

Alternatives:

- Route 82/85 Widening/Upgrade
- Expressway
- Waterbodies and Streams
- State Forest
- Wetlands

State of Connecticut Department of Transportation
Federal Highway Administration

ROUTE 82/85/11
ENVIRONMENTAL IMPACT STATEMENT (EIS)

IN THE TOWNS OF
EAST LYME, MONTVILLE, SALEM AND WATERFORD

STATE PROJECT #120-81

1998 BUILD ALTERNATIVES

Notes:

Sources:
Hydrology: CTDEP Natural Resources Center GIS Database 1994
Alternatives: CTDOT and Maguire Group, Inc.
Wetlands: CTDEP/NRCS and aerial photos

2500 0 2500 5000 Feet

500 0 500 1000 1500 Meters

August 1998

Figure ES-3

below, development of the roadway cross section, location, design speed and horizontal and vertical alignments utilized American Association of State Highway and Transportation Officials (AASHTO) geometric design standards, according to the functional classification of each roadway alternative. Selection of the alignments for each of the build alternatives was based upon these accepted roadway engineering standards. The alternatives considered are summarized as follows:

No Build: The no build alternative consists of continued use of existing roadways within the corridor with no roadway improvements implemented, other than presently programmed improvements. The no build scenario provides for continued regular routine maintenance and spot safety improvements, as necessary, however, no new major construction or capacity improvements would be initiated. For this project, the no build option considers that currently planned and/or programmed improvements would have been put into effect.

Route 82/85/11 Widening Alternatives: These alternatives provide for the widening of Route 82 from Route 11 to Route 85, and the widening of Route 85 to I-395 in the towns of Salem, Montville and Waterford, for a distance of 15 km. (9.3 mi.). The DEIS considers three separate cross-section options for the widening alternative; all three would be designed as a principal rural arterial with a design speed of 100 kph (60 mph). TSM improvements may be implemented as part of the widening improvements. The three widening alternatives are described, as follows:

- Alternative $W_{(4)}$, full four-lane cross-section

  This widening alternative would be designed to conform to accepted roadway standards (AASHTO). The typical cross-section for this alternative consists of two 3.6 m. (12 ft.) lanes in each direction with 2.4 m. (8 ft.) shoulders. A maximum of 2:1 (horizontal:vertical) slopes will be utilized to minimize potential safety impacts. The right-of-way would be widened in some areas to a maximum of 30 m. (100 ft.) where the existing right-of-way is narrow. The estimated construction cost for the $W_{(4)}$ alternative is $41,000,000.

- Alternative $W_{(4)}$m, modified four-lane cross-section

  This alternative is intended to fulfill the same transportation objectives as the $W_{(4)}$ alternative, however, this alternative calls for widening the existing roadway to four 3.3 m. (11 ft.) lanes with narrow shoulders. While 3.3 m. (11 ft.) lanes are the minimum acceptable under the AASHTO, this represents a deviation from the *desired* lane width of 3.6 m. (12 ft.). This reduction in width is being considered because of the sensitive areas, particularly public water supply lands, located in the project area. The typical cross section for this alternative includes 0.6 m. (2 ft.) shoulders and a maximum of 2:1 (horizontal:vertical) slopes. Where the existing right-of-way is narrow, it would be widened to a maximum of 25.2 m. (84 ft.). The estimated construction cost for the $W_{(4)}$m alternative is $33,000,000.

! Alternative $W_{(2)}$, two-lane cross-section with improvements

This widening alternative would be designed to upgrade the existing two-lane roadway to provide a uniform roadway cross-section of two 3.6 m. (12 ft.) lanes with 2.4 m. (8 ft.) shoulders to conform to AASHTO standards. The existing lane widths on Route 85 are typically 3.3 m. (11 ft.) with 0.3 - 0.9 m. (1 - 3 ft.) shoulders, except where specific mprovements have taken place. The right-of-way would be widened to a maximum of 24 m. (80 ft.) where the existing right-of-way is narrow. The estimated construction cost for the $W_{(2)}$ alternative is $31,100,000.

A closed drainage system would be utilized, as necessary, in the vicinity of Lake Konomoc, Fairy Lake and other important resource areas to protect the water supply. This system would incorporate the use of grassed swales and ditches to intercept runoff prior to reaching the roadway. This would reduce sediments and toxins from the roadway from mixing with this "clean" runoff. A closed drainage system consisting of a series of catch basins with deep sumps would be used within the watershed to collect roadway runoff and trap sediment. The runoff would then be routed to a gross particle/oil water separator to remove any oils and fine sediment. In addition, the flow would then be directed through a sedimentation pond to further remove any pollutants. This would provide interaction with a grassed surface to absorb some of these contaminants. The "treated" runoff would then flow to the reservoir. This system would be constructed similarly for each of the widening alternatives.

TSM Alternative: The TSM alternative examines operational improvements, such as intersection upgrades and signal modifications, directed toward increasing capacity and easing the traffic flow within the Route 82/85/11 corridor. These types of traffic operational improvements can be employed to effect moderate improvements in traffic flow at specific intersections and along arterial segments in which traffic flow is impeded by vehicle movement at signalized and/or unsignalized intersections rather than by traffic volume alone. For purposes of evaluating the TSM alternative, an improvement package proposing upgrades at four corridor locations (two intersections and two segments) was outlined in the DEIS; the estimated cost associated with implementing this improvement scenario is $1,700,000.

TDM/Transit Alternative: Transportation Demand Management (TDM) and Transit options are directed toward making the most efficient use of the existing roadway system rather than increasing capacity. Strategies such as mass transit use, spreading out peak hours, increasing vehicle occupancy and ridesharing are considered under this alternative.

! TDM and Ridesharing

TDM options include strategies that seek to reduce peak hour vehicular travel and increase overall mobility. The purpose is to guide motorists toward cost efficient and environmentally-friendly transportation decisions. For purposes of this analysis, the only

TDM strategy that holds promise of meaningful benefit is regional ridesharing. Program attributes may include carpool matching, guaranteed ride home and others. Strategically located commuter lots may aid in the encouragement of ridesharing and may also be convenient origins and destinations for peak-hour bus services.

! Mass Transit - Bus and Rail Service

To estimate the effectiveness of the transit alternative in the Route 82/85/11 corridor, an expansion of existing regional bus service, provided by Southeast Area Transit (SEAT), was evaluated. SEAT does not currently provide service through the study corridor, but service has been mentioned as part of a regional transit expansion. The proposed expansion route would operate between Colchester and New London via Routes 11, 82, and 85. Expansion of existing rail services was also examined.

New Location - Full Build Alternatives: Seven alternative alignments were evaluated for completion of Route 11 from its current point of termination at Route 82 in Salem to the junction of I-95/I-395. Each alternative would follow along the same alignment through the northern and southern portions of the corridor, but follow different overland routes through the central part of the study area. These alternatives are as follows:

! 92PD Alternative - a refinement of the C/D alternative introduced in prior studies. Construction costs for 92PD are estimated at $255,600,000.

! $E_{(4)}$ - a modification of the 92PD alternative, four-lane option. The objective with this alignment is to substantially follow the 92PD alignment, but to further minimize property and natural resource impacts, where feasible. The estimated construction cost for Alternative $E_{(4)}$ is $255,200,000.

! $E_{(2)}$ - a modification of the 92PD alternative, two-lane option. This alternative is a variation of $E_{(4)}$ that would utilize the $E_{(4)}$ southbound lanes only. The estimated construction cost is $154,700,000.

! $F_{(4)}$ - suggested by federal regulatory agency representatives (EPA and FWS) as an alternative that may have the potential to reduce environmental impacts, as compared with the 92PD alignment, by shifting the alignment to the west by approximately 900 m. (3000 ft.). Its estimated cost of construction is $329,700,000.

! $F_{(2)}$ - a two-lane variation of $F_{(4)}$ utilizing only the northbound lanes. The estimated construction cost is $213,100,000.

! $G_{(4)}$ - Like $F_{(4)}$, Alternative $G_{(4)}$ was also suggested by the EPA and FWS as an alternative that may have the potential to reduce some environmental impacts. Construction costs associated with this alternative are estimated at $344,800,000.

- **!** $G_{(2)}$ - a two-lane variation of $G_{(4)}$ utilizing only the northbound lanes. The estimated construction cost for this alternative is $224,600,000.

For each of the selected alternative alignments on a new location (except the 92PD), both four-lane and two-lane versions were evaluated. The rationale for this approach is to examine to what extent the project purposes and needs may be met (or not met) utilizing the more standard four-lane expressway footprint as compared against a minimal roadway footprint (the two-lane variation) in similar alignment.

The typical cross section for all of the four-lane alternatives consists of two 3.6 m. (12 ft.) lanes in each direction, 1.2 m. (4 ft.) inside shoulders and 3 m. (10 ft.) outside shoulders with a 20 m. (66 ft.) minimum median width between the edges of pavement. The right-of-way width is generally 122 m. (400 ft.) along the alignment except in areas that require significant excavation due to severe terrain. The typical cross section for the two-lane alternatives consists of one 3.6 m. (12 ft.) lane in each direction with precast concrete barrier curb (PCBC), commonly referred to as a "Jersey" barrier, 1.2 m. (4 ft.) inside shoulders and 3 m. (10 ft.) outside shoulders. For both the four-lane and two-lane alignments, a 3.6 m. (12 ft.) climbing lane would be used where required. Fill slopes would be graded to a maximum of 2:1 (horizontal:vertical). Regardless of alignment, a new roadway on a new location would be constructed as a limited access facility and grade separated from local roads. Conceptual plans for all of the full build alternatives on new alignment include a full interchange at Route 161.

New Location - Partial Build Alternatives: Four-lane and two-lane versions of a partial build alternative that would have a midway touchdown point (i.e., not continue to I-95/I-395) were developed at the request of the federal resource agencies in an effort to further reduce impacts to wetlands and other resources. These alternatives, $H_{(4)}$ and $H_{(2)}$, include a limited access expressway segment as well as a segment that would be upgraded as described for the $W_{(4)}$ and $W_{(2)}$ widening options. The typical cross sections for the expressway portion would be the same as for the four-lane and two-lane full build alternatives, described above. A four-lane widening would accompany the four-lane limited access roadway alternative, and the two-lane widening scenario would be included if a two-lane limited access roadway is the selected alternative. Estimated construction costs for $H_{(4)}$ and $H_{(2)}$ are $113,600,000 and $81,900,000, respectively.

New Location - Innovative Design Alternative: Several AC members and the general public have suggested the development of an innovative roadway concept on new location as an extension of Route 11 from Salem to Waterford. The concept would have lower design speeds than a limited access highway; the roadway be designed as an arterial roadway, however, land access would be controlled to preserve open space and to eliminate conflicts between through trips and local trips. The reduced cross section, or "footprint", of an arterial roadway as compared with a limited access highway would be the dominant factor in reducing impacts.

The alignments on new location have already been configured to avoid impacts as much as possible. Nevertheless, it may be prudent to pursue this innovative concept further, following publication of this DEIS and receipt of comments from the public and resource agenices. If a preferred alternative emerges as one of the alignments on new location, then this innovative limited access arterial concept could be examined in greater detail as a build option on the selected preferred route.

ES.3.4 ESTIMATED CONSTRUCTION SCHEDULE

The following table (Table ES-3) provides a generalized estimate of the time required to undertake permitting, preliminary design, right-of-way acquisition, final design and construction for the various alternatives, following completion of the FEIS and issuance of a Record of Decision (ROD).

TABLE ES-3
ESTIMATED CONSTRUCTION SCHEDULE

ALTERNATIVE	DESIGN [1]	CONSTRUCTION	TOTAL [2]
Route 82/85 widening (two-lane)	2 years	2 years	4 years
Route 82/85 widening (full four-lane)	2 years	4 years	6 years
New Location	2 years	6 years	8 years

[1] Includes right-of-way acquisition
[2] Following issuance of a ROD

ES.3.5 DEIS ALTERNATIVES' ABILITY TO MEET PROJECT PURPOSES AND NEEDS

All alternatives were assessed as to whether they met the established project purposes and needs. Due to the size of the corridor, the broad range of alternatives being investigated and the complexity of resources and issues being considered, all alternatives would partially meet the purposes and needs identified. When the DEIS/MIS has undergone extensive public distribution and review, and formal public input has been received, more definitive statements can be made as to whether each of the alternatives under consideration meets the purposes and needs identified.

The following provides a generalized comparison of the alternatives; a more detailed discussion of the rationale for the presumption of meeting or not meeting certain project purposes and needs is provided in Volume 2 of 2 of the DEIS.

No Build Alternative: The no build alternative would not meet the **Highway System Linkage**, **Safety and Accident Reduction**, **Function and Use** and **Roadway Capacity** purposes. This alternative would partially meet the **Compatibility with Plans of Development** and **Regional Growth and Development** purposes.

Route 82 and Route 85 Widening Alternatives: The widening alternatives do not meet the **Highway System Linkage** purpose. It would meet the **Safety and Accident Reduction** purpose more than the no build alternative. The widening alternatives would partially meet the **Function and Use**, **Roadway Capacity, Compatibility with Plans of Development** and **Regional Growth and Development** purposes.

TSM and TDM/Transit Alternative: The TSM and TDM/Transit alternatives do not meet the **Highway System Linkage, and Function and Use** purposes and would likely result in a negligible change in **Safety and Accident Reduction** from the no build. The TSM and TDM/Transit alternatives would partially meet the **Roadway Capacity**, **Compatibility with Plans of Development** and **Regional Growth and Development** purposes.

New Location Full Build Alternatives: The full build alternatives do meet the **Highway System Linkage** purpose and would partially meet the **Safety and Accident Reduction**, **Function and Use**, **Roadway Capacity**, **Compatibility with Plans of Development** and **Regional Growth and Development** purposes.

New Location Partial Build Alternatives: The partial build alternatives would not meet the **Highway System Linkage** purpose. The partial build alternatives would partially meet the **Safety and Accident Reduction**, **Function and Use, Roadway Capacity**, **Compatibility with Plans of Development** and **Regional Growth and Development** purposes.